PROC. ENTOMOL. SOC. WASH.
101(3), 1999, pp. 687–689

NOTE

A Checklist of Termites (Isoptera) from Kaieteur National Park, Guyana

Nearly two-thirds of Guyana consists of dense, river-permeated rainforests covering Precambrian rock. On the western border with Venezuela and Brazil, erosion of Roraima sandstone formations, laid down in the Cretaceous, has formed the flat-topped tepuis known as the Pakaraima Mountains. Several rivers begin at the top of the Pakaraimas, in places resulting in spectacular waterfalls. Pedestalled where the Pakaraimas abruptly give way to lowland rainforest, and with a straight drop of 741 ft., Kaieteur Falls on the Potaro River (5°10′N, 59°29′W) is the most dramatic example. It is the second highest waterfall in the Western Hemisphere and is the location of Guyana's only National Park.

A fascinating range of habitats is found in the park. At the top of the falls, and along the upper edges of the canyon lining the Potaro River gorge beyond the falls, water vapor from the roaring tumult wafts over white and pink sand forest adjacent to a shrub-herb savanna. Floral species found there include giant, 3-meter tall bromeliads (*Brocchinia micrantha* [Baker] Mez), bladderworts (*Utricularia humboltii,* Rob. Schomb.), lichens, and numerous trees (Clusiaceae and Rubiaceae families) and shrubs (e.g., *Inga sertulifera* DC.) (Kelloff and Funk 1999. A Checklist of the ferns, fern allies, and flowering plants of Kaieteur National Park, Guyana. Smithsonian Institution, Washington, DC). Many of the trees and are covered with mosses, orchids, and other epiphytes. The Smithsonian Institution's Biodiversity of the Guianas (BDG) Program, in collaboration with the Center for Biodiversity at the University of Guyana, has been conducting a survey of the flora and fauna of the country. As part of an initial BDG expedition to collect and describe the termites of Guyana, we spent four days collecting at Kaieteur National Park. The following report is an annotated checklist of species that were collected, with three sampling areas distinguished: (1) Riverine forest above the falls, (2) white and pink sand forest on the canyon plateau lining the falls, and (3) shrub-herb savanna on the canyon above and beyond the falls. Feeding group assignments follow recent practice (Sleaford et al. 1996. Ecological Entomology, 21: 279–288). Replicate vouchers for these collections have been deposited with the Center for Biodiversity, University of Guyana (Georgetown), The Natural History Museum (London), and the National Museum of Natural History, Smithsonian Institution (Washington, DC). To our knowledge, this is the first survey of termites conducted in Guyana's only national park.

ANNOTATED CHECKLIST

RHINOTERMITIDAE

Dolichorhinotermes longilabius (Emerson). Found with *Araujotermes parvellus* in small branch buried in ground (2); in old dead standing tree stump by river (1); in dead wood (1); wood feeder.

Dolichorhinotermes nr. *tenebrosus* (Emerson). In dead wood (2); in standing wet dead tree stump (2); wood feeder.

Heterotermes tenuis (Hagen). Under bark of dead twig (2); in hard log (2); in carton material at base of rock in sandy soil (3); wood feeder.

Coptotermes testaceus (Linneaus). In rotting log (2); wood feeder.

TERMITIDAE

APICOTERMITINAE

Anoplotermes banksi Emerson. In very humic soil (2); soil feeder.

Anoplotermes genus-group, sp. A. In sandy humic soil under root mass at base of medium-sized tree (2); soil feeder.

Anoplotermes genus-group, sp. B. In suspended soil/roots at base of bromeliad (3); soil feeder.

Anoplotermes genus-group, sp. C. In soil (2); soil feeder.

TERMITINAE

Cylindrotermes parvignathus Emerson. In dry dead wood (2); in very small twigs within root mat of very humic soil (2); wood feeder.

Neocapritermes, n. sp. A. In soil plastered within dead wood (2); soil-wood interface feeders.

Termes fatalis Linneaus. Near river, in carton nest at base of fallen tree (1); soil-wood interface feeder.

NASUTITERMITINAE

Armitermes minutus Emerson. In very decayed wood (2); in root mat within very humic soil (2); in humus-rich root mat at tree base (2); soil-wood interface feeder.

Embiratermes sp. A. In mound on ground (2); soil or soil-wood interface feeder.

Araujotermes parvellus (Silvestri). In dead dry tree stump by river (1); secondary occupant in old *Nasutitermes* sp D carton nest on ground in rocky unforested area, found with *Nasutitermes* sp B (3); in standing dead wet stump (2); with *Dolichorhinotermes longilabius* in small branch (2); in abandoned water-logged carton nest (probably *Nasutitermes*) in very old rotten (but dry) dead tree (2); under bark of dead twig (2). Recorded (Fontes 1982. Revista Brasileira de Entomologia 26: 99–108) in carton nests of other species—it is probably a carton feeder within other termites' nests.

Coatitermes kartaboensis (Emerson). Probably from (2). Reported (Mathews 1977. Studies on termites from Mato Grosso State, Brazil. Academia Brasileira de Ciências, Rio de Janeiro.)[as *Convexitermes* sensu lato] as feeding in rotten dead wood and on material already "transformed" by other termites.

Nasutitermes banksi Emerson. Apparently feeding and nesting on lichen-encrusted rock overlooking the fall (3). However, the mandibular structure and gut contents appear to be typical of *Nasutitermes* species feeding on dead wood. The nesting habit is unusual for the genus.

Nasutitermes intermedius Banks. In dead wood (2); wood feeder.

Nasutitermes gaigei (Emerson). In humic root mass at base of tree (2); wood feeder.

Nasutitermes sp. A. In dry dead wood (2); observed foraging during daytime on forest floor; wood or litter feeder.

Nasutitermes sp. B. Found with *Araujotermes parvellus* in old *Nasutitermes* sp D carton nest on ground (3); wood feeder.

Nasutitermes sp. C. In dead wood (2); wood feeder.

Nasutitermes sp. D. From small low (30–40 cm high) nests on rocky ground (3) and sub-spherical arboreal nests (2); wood or wood/litter feeder.

Emerson (1925. Zoologica, 6, 291–459) recorded 79 species from Guyana, and 89 species are recorded in Araujo (1977. Catalogo dos Isoptera do Novo Mundo. Academia Brasileira de Ciencias, Rio de Janeiro). Clearly, the Kaieteur checklist, with 22 species, does not accurately represent the potential diversity of the Kaieteur area given its habitat diversity. We found a surprisingly high apparent abundance of termites in the humus-rich woodland (area 2) scattered in patches (<1 ha) among the bare areas above the waterfall, although we had too little time to survey the area in detail. The bare areas themselves seem to be devoid of termites except for epigeal nests of *Nasutitermes* sp. D, which may be foraging into the woodland or on dead plant material growing sparsely in the savanna area. Our single observation of *Anoplotermes*-group sp. B in rich suspended humic material at the base of bromeliads suggests, however, that this may be a microhabitat worth investigating in further studies.

The faunistic composition of the area is very similar to that recorded from Kartabo,

suggesting that there was little obvious turnover between the localities. Of the Kaieteur species which were definitely identifiable (i.e., excluding *Nasutitermes, Embiratermes,* and *Anoplotermes* genus-group species to which we were unable to assign species names) only *Termes fatalis, Neocapritermes* n. sp. A, and *Coptotermes testaceus* were not also recorded from Kartabo, and of these the last has been recorded from elsewhere in Guyana (Araujo 1977. Catalogo dos Isoptera do Novo Mundo. Academia Brasileira de Ciencias, Rio de Janeiro). The four *Nasutitermes* to which we have been unable to give species names may or may not fit into existing species concepts; we simply do not have enough specimens to be certain. The *Neocapritermes* species and three *Anoplotermes*-group species appear to be new to science. Taken with samples collected during the same sampling trip in Paruima, Cuyui-Mazuruni, Guyana, 17 new species of *Anoplotermes* were collected in seven days of field work (Davies et al., unpublished data).

In a provisional study of this kind, one might expect to pick up only the most common and widespread taxa. More detailed sampling in the varied habitats of the reserve would undoubtedly reveal numerous other species, some perhaps more characteristic of this unusual habitat.

This is no. 36 in the Smithsonian's BDG publication series and contribution no. 99-202-J of the Kansas Agricultural Experiment Station. We are grateful to Vicki Funk, Carol Kelloff, and their staff for support and guidance, and to James Singh and Dyyantie Naraine of the Center for the Study of Biodiversity, University of Guyana, for extending to us every courtesy.

Paul Eggleton, Richard Davies, *Entomology Department, The Natural History Museum, London, SW7 5BD, U.K. (e-mail: pe@nhm.ac.uk)*; Matthew D. Kane, *Laboratory of Molecular Systematics, National Museum of Natural History, Smithsonian Institution, Washington, D.C., MD 20746, U.S.A.*; and Srinivas Kambhampati, *Department of Entomology, Kansas State University, Manhattan, KS 66506, U.S.A.*

PROC. ENTOMOL. SOC. WASH.
101(3), 1999, pp. 689–692

NOTE

Otiorhynchus ovatus, O. rugosostriatus, and *O. sulcatus* (Coleoptera: Curculionidae): Exotic Weevils in Natural Communities, Mainly Mid-Appalachian Shale Barrens and Outcrops

The Palearctic, mainly European genus *Otiorhynchus* Germar is represented in North America by 16 adventive species that were introduced, and have been further spread, with shipments of nursery stock or other horticultural products (Warner and Negley. 1976. Proceedings of the Entomological Society of Washington 78: 240–262; Maier. 1978. Environmental Entomology 7: 854–857; Johnson and Lyon. 1988. Insects that Feed on Trees and Shrubs. Cornell University Press, Ithaca, NY, 556 pp.). Several species, including *O. ovatus* (L.), *O. rugosostriatus* (Goeze), and *O. sulcatus* (F.), have become pests of agricultural and horticultural crops (Essig. 1933. California Department of Agriculture Monthly Bulletin 22(7–11): 379–409). Adults are flightless, parthenogenetic, and mainly nocturnal and univoltine. These three species are polyphagous, with larvae generally more host restricted than adults (Smith. 1932. United States Department of Agriculture. Technical Bulletin 325: 1–45; Essig 1933; Warner and